

REMARKS

Claims 1 - 21 are pending. Claims 1 - 20 have been amended. Claim 21 has been added. No new matter has been added.

In the November 19, 2004 Office Action, the Examiner rejected claims 1 - 20 under 35 U.S.C. § 101 alleging the claims are drawn to non-statutory subject matter and do not produce a useful, concrete, and tangible result. The applicants have attempted to amend claims 1 - 20 to address the Examiner's rejection. If the Examiner does not believe that the amendments address his rejection, the applicants invite the Examiner to contact the undersigned attorneys with suggestions.

As discussed in MPEP § 2106, 2100 - pages 17 and 18), the applicants' method (claim 1), simulator (claim 8) and computer program (claim 15) produce a concrete, tangible, and useful result of simulating topography of a geometrical change of a material. The applicant's claim 21 produces a concrete, tangible, and useful result of simulating topography of a semiconductor surface having a geometrical change of a material. The applicants respectfully submit that claims 1 - 20, as amended, and newly added claim 21 are drawn to statutory subject matter. Accordingly, the applicants respectfully request that the rejection under 35 U.S.C. § 101 be withdrawn.

The Examiner rejected claims 1 - 20 under 35 U.S.C. 112, second paragraph, because independent claims 1, 9, and 15 lack antecedent basis. Applicants have amended claims 1, 9, and 15 to provide the necessary antecedent basis and respectfully request that the rejection of claims 1 - 20 under 35 U.S.C. 112, second paragraph be withdrawn.

The Examiner rejected claims 1 - 20 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,192,330 to Mitsutoshi Nakamura ("the Nakamura reference") in view of Applicant Admitted Prior Art ("AAPA") in the background section of the current application, published as U.S. Patent Publication No. 2001/0025233. This rejection is respectfully traversed in so far as the rejection is applicable to the currently pending claims.

Independent claim 1, as amended, recites:

A simulation method for simulating topography with a geometrical change of a material comprising:  
generating plural boundary points on a string formed on a surface of the material;  
obtaining a first length of a line segment between the boundary points;  
calculating displacement of the boundary points corresponding to the geometrical change according to a process model;  
moving the boundary points by the displacement;  
obtaining a second length of the line segment between the boundary points after the boundary points are moved; and  
**making reference to the first and second lengths to add or eliminate the boundary points.**

The Nakamura reference does not disclose, teach, or suggest the simulation method of claim 1, as amended. The Examiner states that the Nakamura reference does not disclose the steps of calculating the displacement of the boundary points, moving the boundary points by the displacement, and adding or eliminating the boundary points in reference to the first and second lengths. (*Office Action, page 6*). Applicants agree with the Examiner. Accordingly, applicants respectfully submit that claim 1, as amended, distinguishes over the Nakamura reference.

The Applicant Admitted Prior Art ("AAPA") does not make up for the deficiencies of the Nakamura reference. The Examiner states that the AAPA teaches the step of

calculating a displacement of the boundary point according to a process model, moving the boundary point by the displacement, and **making reference to the first and second lengths to add or eliminate the boundary point.** (*Office Action, page 6*).

The applicants respectfully disagree with the Examiner regarding the disclosure of the AAPA regarding the highlighted limitation. Specifically, the AAPA discloses calculating the lengths of all line segments  $s$  after the boundary point is moved. Then, if adding a boundary point, it is determined whether or not the lengths  $r_i$  of the line segments  $s_i$  after the boundary point is moved is greater than a maximum length  $l_{\max}$ . If  $r_i$  is greater than  $l_{\max}$ , a new boundary point is added. If deleting a boundary point, the lengths  $r_i$  of the line segments  $s_i$  after the boundary point is moved are evaluated against a minimum length  $l_{\min}$ . If  $r_i$  is less than  $l_{\min}$ , one of the boundary points  $P$  constituting the line segment  $s_i$  is eliminated and a new line segment is produced. (*AAPA, paragraphs [0008 - 0009]*). There is no discussion of referencing the length of the first line segment, i.e., before the boundary points are moved.

This is not the same as a simulation method for simulating topography with a geometrical change of a material including obtaining a first length of a line segment between the boundary points, obtaining a second length of the line segment between the boundary points after the boundary points are moved; and **making reference to the first and second lengths to add or eliminate the boundary points.** The AAPA does not disclose making reference to a first length in adding or eliminating the boundary point. The AAPA discloses only that a maximum or a minimum line segment is compared against the second line segment length. Thus, in the invention of claim 1, a maximum or minimum line segment does not to be established which can lead to

decreased calculation time and higher calculation accuracy. In other words, the topography of the geometrical change of the material can be simulated with more accuracy. Accordingly, applicants respectfully submit that claim 1, as amended, distinguishes over the AAPA, alone or in conjunction with the Nakamura reference.

The applicants note that the Examiner has stated that his interpretation of the limitation "making reference to the first and the second lengths to add or eliminate the boundary points" means checking the length of the first and second line segments against values and therefore adding or eliminating boundary points accordingly." (*Office Action, page 2*). Assuming the Examiner's interpretation, the applicants respectfully submit that the AAPA still does not disclose "checking the length of the first and second line segments against values and therefore adding or eliminating boundary points accordingly." The AAPA does not check the length of the first line segments against values, it only calculates the length of the first line segment. This also supports that claim 1, as amended, distinguishes over the AAPA, alone or in combination with the Nakamura reference.

Independent claims 9 and 15, as amended, recite limitations similar to independent claim 1, as amended. Accordingly, applicants respectfully submit that independent claims 9 and 15 distinguish over the Nakamura reference and the AAPA, alone or in combination, for reasons similar to those discussed above in regard independent claim 1, as amended.

Claims 2 - 8, 10 - 14, and 16 - 20 depend, indirectly or directly, on claims 1, 9, and 15, respectively. Accordingly, applicants respectfully submit that claims 2 - 8, 10 - 14, and 16 - 20 distinguish over the Nakamura reference and AAPA, alone or in

combination, for reasons similar to those discussed above in regard to claims 1, 9, and 15.

Independent claim 21 distinguishes over the cited references. Independent claim 21 recites:

A simulation method for simulating topography of a semiconductor surface having a geometrical change of a material, comprising:  
generating two boundary points on a string formed on the surface of a material;  
obtaining a first length of a line segment between the two boundary points;  
calculating a displacement of two new boundary points according to a process model;  
moving the two boundary points by the displacement to the two new boundary points;  
obtaining a second length of a line segment between the two new boundary points after the two boundary points are moved;  
**comparing the second length to the first length multiplied by a factor to add a new boundary point or to eliminate an existing boundary point to simulate the geometrical change of the material.**

The Nakamura reference, as stated by the Examiner, does not disclose, teach, or suggest a simulation method including the calculating limitation, the moving limitation, the obtaining limitation, or the adding or removing of boundary points. Accordingly, claim 21 distinguishes over the Nakamura reference.

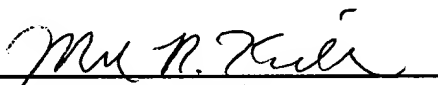
The AAPA does not make up for the deficiencies of the Nakamura reference. As discussed above, the AAPA compares only the second length to a maximum length (for adding a boundary point) or to a minimum length (for deleting a boundary point). This is not the same as **comparing the second length to the first length multiplied by a factor**. Accordingly, applicants respectfully submit that claim 21 distinguishes over the AAPA, alone or in combination with the Nakamura reference.

Applicants believe that the foregoing amendments place the application in condition for allowance, and a favorable action is respectfully requested. If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles telephone number (213) 488-7100 to discuss the steps necessary for placing the application in condition for allowance should the Examiner believe that such a telephone conference would advance prosecution of the application.

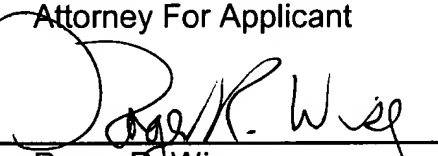
Respectfully submitted,

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